

Name: \_\_\_\_\_

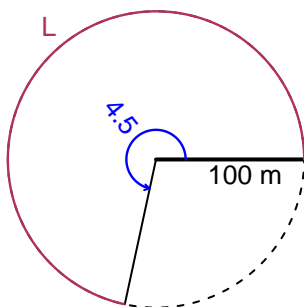
Date: \_\_\_\_\_

## Trig Final (TEST v603)

- You should have a calculator (like [Desmos](#)) and a [unit-circle](#) reference sheet.

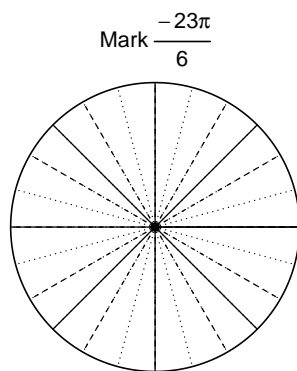
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 100 meters. The angle measure is 4.5 radians. How long is the arc in meters?

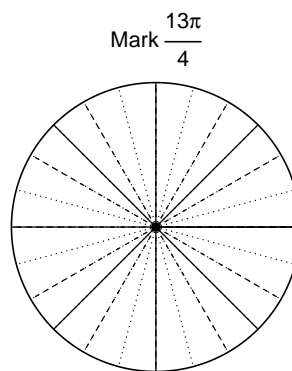


### Question 2

Consider angles  $-\frac{23\pi}{6}$  and  $\frac{13\pi}{4}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\cos\left(-\frac{23\pi}{6}\right)$  and  $\sin\left(\frac{13\pi}{4}\right)$  by using a unit circle (provided separately).



Find  $\cos(-23\pi/6)$



Find  $\sin(13\pi/4)$

**Question 3**

If  $\sin(\theta) = \frac{-55}{73}$ , and  $\theta$  is in quadrant III, determine an exact value for  $\cos(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with a midline at  $y = 6.98$  meters, a frequency of 8.84 Hz, and an amplitude of 3.33 meters. At  $t = 0$ , the mass is at the minimum height. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).